

In the Claims:

Please cancel claims 2-15 and 17-28. Please amend claim 1 and 16. The claims are as follows:

1. (Currently amended) A mask inspection method, comprising:

providing generating a mask fabrication database describing geometrical shapes S to be printed as part of a mask pattern on a reticle to fabricate a mask through use of a mask fabrication tooling, said geometrical shapes S appearing on the mask pattern as geometrical shapes S' upon being printed by the mask fabrication tooling in accordance with the mask fabrication database, at least one of said geometrical shapes S' being geometrically distorted relative to a corresponding at least one of said geometrical shapes S due to a lack of precision in the mask fabrication tooling; ~~and~~

providing generating a mask inspection database to be used for inspecting the mask after the mask has been fabricated by the mask fabrication tooling using the mask fabrication database, said mask inspection database describing geometrical shapes S'' approximating said geometrical shapes S', a geometric distortion between said geometrical shapes S' and said geometrical shapes S'' being less than a corresponding geometric distortion between said geometrical shapes S' and said geometrical shapes S₁

fabricating the mask via the mask fabrication tooling using the mask fabrication database;

inspecting the fabricated mask using the mask inspection database;

determining an inspection failure rate from said inspecting, said determined inspection failure rate being lower than an inspection failure rate that would have been determined by using the mask fabrication database for inspecting the fabricated mask;

wherein said generating the mask inspection database comprises:

generating a calibration dataset by performing the steps of: providing a plurality of generic geometrical shapes, printing said generic geometrical shapes on a reticle test mask, measuring said printed generic geometrical shapes, and collecting the provided generic geometrical shapes and the measured printed generic geometrical shapes to form the calibration dataset,

deriving a calibration transformation from the calibration dataset by performing a statistical regression on the calibration dataset, and

generating S'' from S by applying the calibration transformation to S ;

wherein the geometrical shapes S includes a geometric shape S_i ;

wherein the calibration transformation transforms S_i to a geometric shape S_i'' of the geometrical shapes S'' ;

wherein a first dimension of S_i'' in a direction X differs from a corresponding first dimension of S_i in the direction X by a first amount that is a first function of the corresponding first dimension of S_i in the direction X , a second dimension of S_i in a direction Y that is orthogonal to the direction X , and a distance from S_i to a first neighbor of S_i , said first neighbor of S_i being a geometric shape comprised by the geometrical shapes S ;

wherein a second dimension of S_i'' in the direction Y differs from a corresponding second dimension of S_i in the direction Y by a second amount that is a second function of the

corresponding second dimension of S_i, in the direction Y, a third dimension of S_i, in the direction X, and a distance from S_i to a second neighbor of S_i, said second neighbor of S_i being a geometric shape comprised by the geometrical shapes S.

2-15. (Canceled)

16. (Currently amended) A mask inspection system, comprising:

means for providing a first subsystem configured to generate a mask fabrication database describing geometrical shapes S to be printed as part of a mask pattern on a reticle to fabricate a mask through use of a mask fabrication tooling, said geometrical shapes S appearing on the mask as geometrical shapes S' upon being printed by the mask fabrication tooling in accordance with the mask fabrication database, at least one of said geometrical shapes S' being geometrically distorted relative to a corresponding at least one of said geometrical shapes S due to a lack of precision in the mask fabrication tooling; and

means for generating a second subsystem configured to generate a mask inspection database to be used for inspecting the mask after the mask has been fabricated by the mask fabrication tooling using the mask fabrication database, said mask inspection database describing geometrical shapes S'' approximating said geometrical shapes S', a geometric distortion between said geometrical shapes S' and said geometrical shapes S'' being less than a corresponding geometric distortion between said geometrical shapes S' and said geometrical shapes S;

wherein the second subsystem is further configured to fabricate the mask via the mask fabrication tooling using the mask fabrication database, inspect the fabricated mask using the

mask inspection database, and determine an inspection failure rate from inspecting the fabricated mask;

wherein the mask inspection database is configured to cause the determined inspection failure rate to be lower than an inspection failure rate that would have been determined by using the mask fabrication database for inspecting the fabricated mask;

wherein the second subsystem is configured to generate a mask inspection database by performing a process comprising:

generating a calibration dataset by performing the steps of: providing a plurality of generic geometrical shapes, printing said generic geometrical shapes on a reticle test mask, measuring said printed generic geometrical shapes, and collecting the provided generic geometrical shapes and the measured printed generic geometrical shapes to form the calibration dataset,

deriving a calibration transformation from the calibration dataset by performing a statistical regression on the calibration dataset, and

generating S" from S by applying the calibration transformation to S;

wherein the geometrical shapes S includes a geometric shape S₁;

wherein the calibration transformation transforms S₁ to a geometric shape S₁" of the geometrical shapes S";

wherein a first dimension of S₁" in a direction X differs from a corresponding first dimension of S₁ in the direction X by a first amount that is a first function of the corresponding first dimension of S₁ in the direction X, a second dimension of S₁ in a direction Y that is

orthogonal to the direction X , and a distance from S_i to a first neighbor of S_i , said first neighbor of S_i being a geometric shape comprised by the geometrical shapes S_j

wherein a second dimension of S_i in the direction Y differs from a corresponding second dimension of S_j in the direction Y by a second amount that is a second function of the corresponding second dimension of S_j in the direction Y , a third dimension of S_i in the direction X , and a distance from S_i to a second neighbor of S_i , said second neighbor of S_i being a geometric shape comprised by the geometrical shapes S_k .

17-28. (Canceled)